FHB recd 2-26-82
cc: L. Ogren
N. Thompson &
J. Powers

NMFS AERIAL TURTLE CENSUS

U.S. VIRGIN ISLANDS

REVISED PLAN

January 1, 1979 to December 31, 1980

<u>Contract Issued</u>: Department of Conservation and Cultural Affairs
Division of Fish and Wildlife

<u>Purchase Order No.</u>: NA80-GA-A-00055

<u>Final Report</u>: January, 1982

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INTRODUCTION

Three species of marine turtles are currently considered resident federally listed endangered species in the United States Virgin Islands:

Hawksbill (*Eretmochelys imbricata*)
Leatherback (*Dermochelys coriacea*)
Green (*Chelonia mydas*)

The Leatherback presently nests on St. Croix and occasionally on St. Thomas (DFW records). The Hawksbill nests on St. John (Small, 1980), St. Thomas (DFW records), and St. Croix (Towle, *et al.*, 1978). The Green is reported to nest on St. Croix (Seaman and Randall, 1962; Towle, *et al.*, 1978) and has been reported from St. John and St. Thomas by local residents. The sizes of these breeding populations are unknown, and only scant information on the breeding biologies of these species has been obtained (Pritchard, 1971; Rainey, 1973; Carr, *et al.*, 1978; Towle, *et al.*, 1978; Small, 1980).

Available information (Towle, *et al.*, 1978; Rainey, unpublished) indicates that the Virgin Islands provides an important population refuge for the Hawksbill, Green and Leatherback turtles. Sandy Point is the only known nesting aggregation of Leatherback turtles in the U.S. Territories

(Caldwell, 1959). It is known that Hawksbill turtles were more abundant in the past. Exploitation is currently prohibited, but it is not known whether the population is on its way to recovery. Studies on the breeding biology of the Hawksbill in the Virgin Islands have been restricted to incidental data gathered by the National Park Service and Division of Fish and Wildlife researchers.

Present literature indicates that the Hawksbill is slowly being extirpated from the Atlantic and Caribbean (Carr and Stancyk, 1975). The Green turtle is still under heavy exploitation in the Caribbean, but difficulties in estimating actual population size have made it difficult to determine if stocks are declining (Carr, et al., 1978). Despite the fragmentary information available, it is apparent that Virgin Islands turtle populations require affirmative management action if their assumed decline in abundance is to be reversed. Information must be gathered in order that these management strategies can be based on fact and achieve the desired ends.

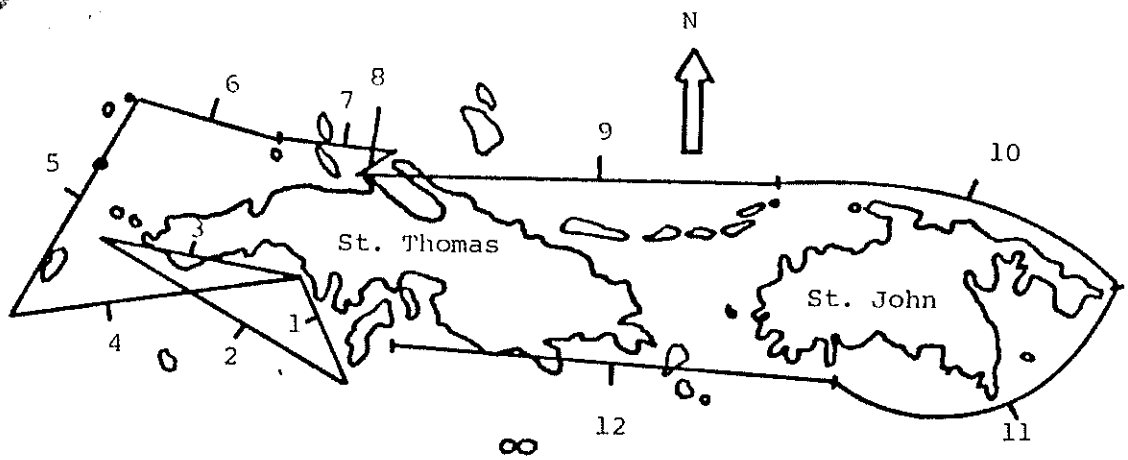
The goal of the present study is to develop a method of aerially censusing populations of marine turtles and to census the marine turtles of the Virgin Islands over a two-year period using this method. Data to be derived from the census include seasonal patterns of abundance, as well as locations of turtle concentrations. Some effort was made to identify turtles by species and size.

METHODS

This study was carried out in the nearshore coastal waters of the U.S. Virgin Islands. All flights were made in a Cessna 172 with one observer. Flight paths for the St. Thomas/St. John portion and the St. Croix portion are shown in Figure 1. Segments and segment lengths are identified in Table 1. Data was recorded for each flight path segment as number of turtles observed with tentative species identifications and carapace sizes. Data was analyzed as number of turtles per flight per nautical mile for both segment and month.

As a precursor to the actual census, various aerial census techniques were tested. The selection of the optimum-flight altitude was carried out by flying a total of 18 complete flights around St. Croix (including Buck Island) (see Fig. 1), six each at 61m (200 feet), 122m (400 feet), and 183m (600 feet). Viewing field width was determined by flying at the various altitudes over a pier whose segments were of known length. Flights were made at the same hour ($\pm$ 15 min.) on consecutive days when possible. Flight altitude for any given flight was selected randomly. This effort was combined with a test to evaluate the accuracy of the observer's size estimation of turtles. Three to five turtle shells were placed on a beach. The observer flew over the beach at the three different altitudes during the altitude selection flights.

Figure 1. Flight paths for the aerial turtle census around St. Thomas/St. John and St. Croix showing the segment numbers (refer to Table 2 for segment location names).



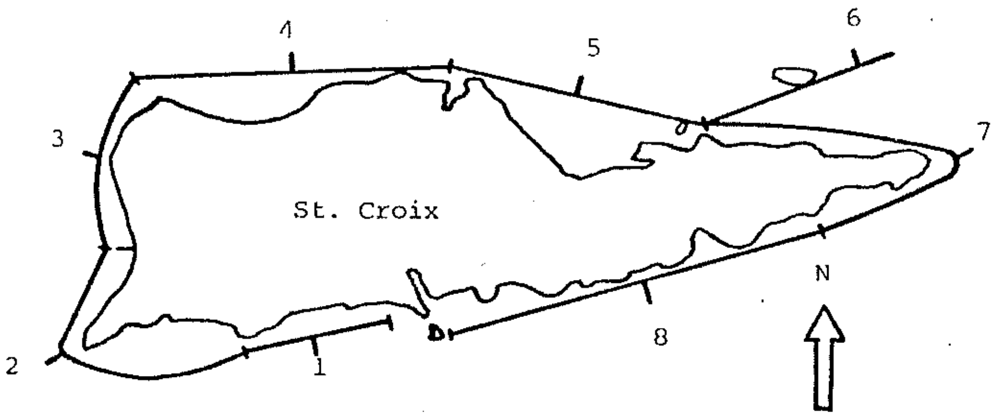


Table 1. Flight Segments and Code Numbers

St. Thomas

Code #	Segment		Length of Segment (nm)
1.	Airport	Southside Water Island	2.75
2.	Southside Water Island	Salt Cay	6.75
3.	Salt Cay	Airport	4.75
4.	Airport	South Savanna Island	7.00
5.	South Savanna Island	Cricket Cay	6.00
6.	Cricket Cay	Lizard Rocks	3.50
7.	Lizard Rocks	Magens Bay Point	2.75
8.	Magens Bay Point	Hull Bay Point	1.00
9.	Hull Bay Point	Carval Rock	9.75
10.	Carval Rock	Eastern Tip of St. John	9.00
11.	Eastern Tip of St. John	Dittlif Point, St. John	8.00
12.	Dittlif Point, St. John	East Point of Water Island	10.50

St. Croix

Code #	Segment		Length of Segment (nm)
1.	Manning Bay	Long Point Racetrack	3.50
2.	Long Point Racetrack	Frederiksted Pier	7.00
3.	Frederiksted Pier	Ham's Bluff Lighthouse	4.25
4.	Ham's Bluff Lighthouse	West Side of Salt River Estuary	7.50
5.	West Side of Salt River Estuary	Pull Point	6.25
6.	Pull Point	(and including) Buck Island	4.50
7.	Pull Point	Turner Hole Beach Hotel	9.50
8.	Turner Hole Beach Hotel	Ruth Island	8.75

Time of day was also tested to determine if number of turtles observed differed. A total of 10 flights at 183m in altitude were flown, two per day at 0930 and 1330 hours.

Data from the St. Thomas/St. John and St. Croix portions of this study are treated separately due to differences in numbers of census flights, census continuity, and observer bias. No flights were flown in St. Croix from January to October 1980 due to cost limitations.

Data was also collected on turtle nesting activities on St. Thomas and its offlying cays. This was done primarily by Division of Fish and Wildlife personnel on routine beach checks. Beach access was made primarily by boat. As nests were located, they were hidden by brush and by sweeping the sand surface to prevent poaching and recounting.

RESULTS

The optimum-census altitude was chosen as 61m. The results of the test flights to determine flight altitude show that although viewing field width increased with an increase in altitude, number of turtles observed did not vary significantly (one-way ANOVA, F=0.0313, P n.s.) (Table 2). In addition, species identifications and carapace size estimations became increasingly difficult with increased

Table 2. Number of turtles observed on six flights at each altitude and the viewing field width from each altitude (see text for method of determination).

Altitude (m)	Calculated Viewing Field Width (m)	Total # Turtles Observed	Mean # Turtles Per Flight	Standard Deviation
61	75	126	20.8	9.93
122	151	129	21.5	12.71
183	184	135	22.5	11.99

Table 3. Number of turtles observed on five flights at each time of day.

Time of Day	Total # Turtles Observed	Mean # Turtles Per Flight	Standard Deviation
0930	71	14.2	2.17
1330	78	15.2	2.59

altitude. The carapace size estimation test produced estimates that were within six inches of the actual shell size. However, size estimations in this report will be treated with caution.

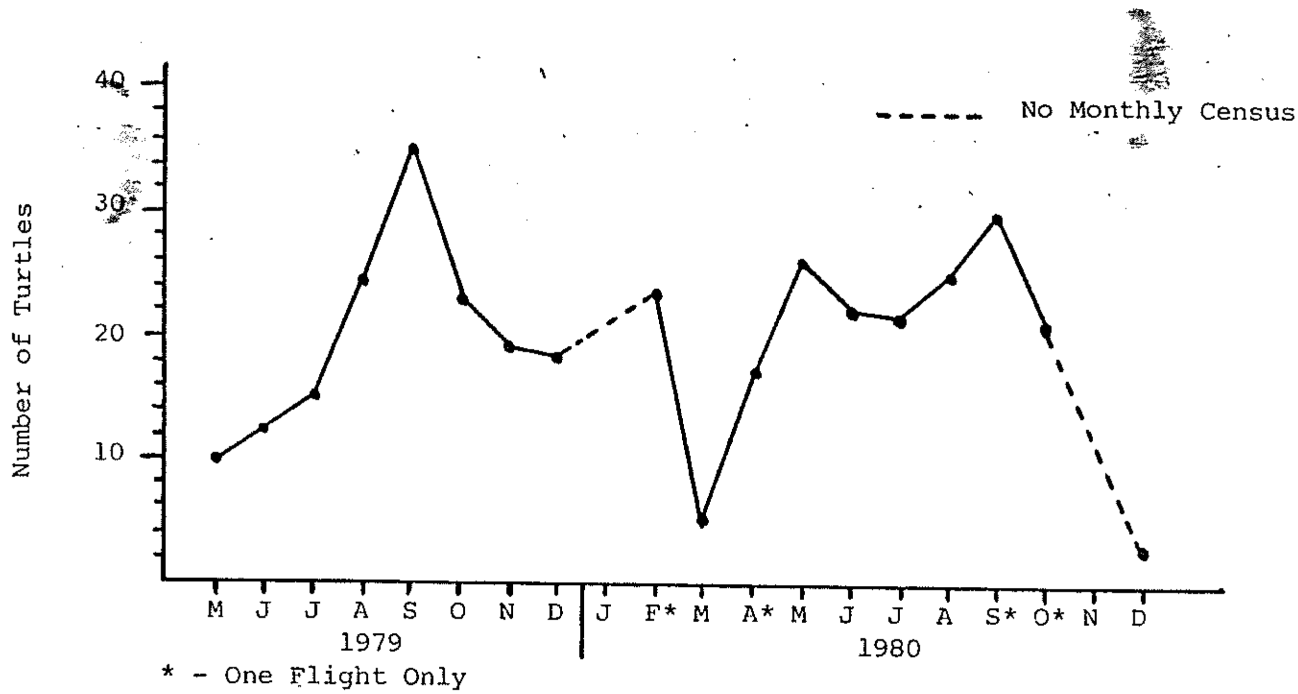
The test flights to determine if number of turtles observed differed for different times of day produced results that indicate no significant difference (t=0.097, P n.s.) (Table 3).

The census data for average number of turtles observed per flight per month suggests an annual trend that more or less repeats itself over a two-year period for the St. Thomas/ St. John area (Fig. 2). There appears to be a peak in number of turtles observed during the summer months with September having the highest numbers for both years. The low point in numbers of turtles observed occurs in the early spring. Sharp fluctuations in the curve may be a product of small sample size (i.e. only one flight) for various months.

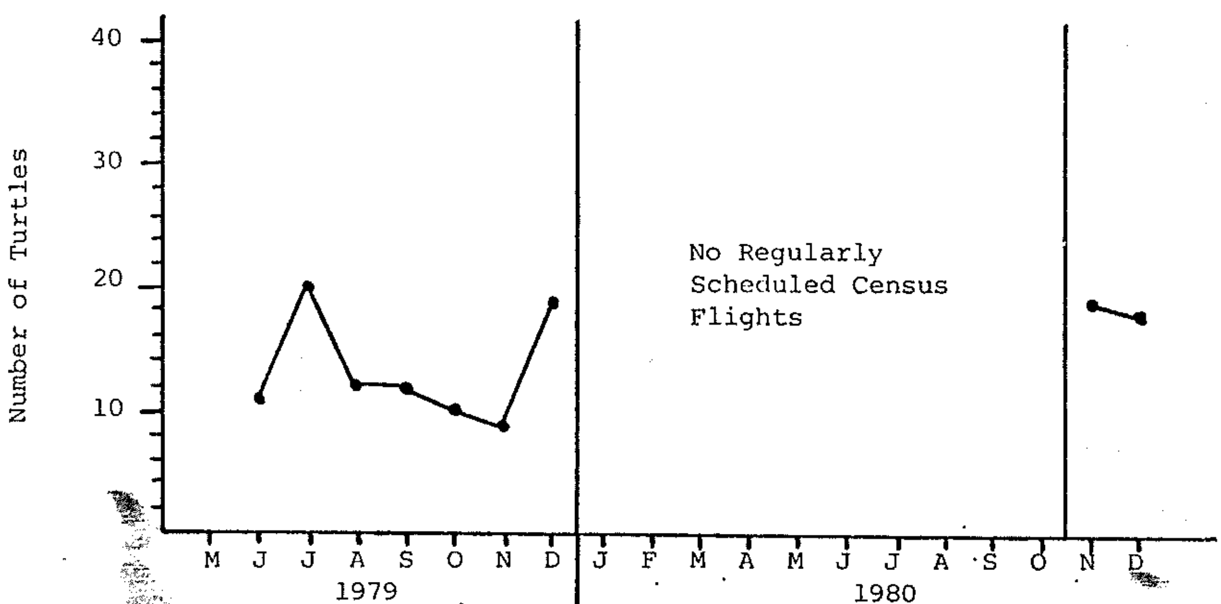
The St. Croix data does not show any clear trends (Fig. 2) as a 10-month gap exists during which no data was collected. However, the data that does exist for 1979 shows a peak in the summer with another around December. The 1980 data does not cover sufficient time to show annual trends.

Figure 2. Average Number of Turtles Observed per Flight per Month.

St. Thomas/St. John



St. Croix



When the data is analyzed for number of turtles observed per flight per nautical mile per segment, some distributional patterns are apparent (Table 4). The segments on the St. Thomas/ St. John portion had significantly different numbers of turtles observed (one-way ANOVA, $F=29.054$, $P < 0.01$). The area of highest turtle density is near the mouth of Magens Bay (segment 8) and is significantly different from other high density areas (Student-Newman-Keuls Test, $P < 0.05$) (Figure 3). When segments are separated as to inshore (segments 1, 3, 7, 8, 10, 11, and 12) and offshore (segments 2, 4, 5, 6, and 9), it is apparent that turtles are much more abundant in nearshore waters than offshore waters (one-way ANOVA, $F=58.596$, $P < 0.01$). This separation is based on more than 50 percent of a flight segment being over water greater than one mile offshore from a major island or large offlying cays.

The St. Croix segments are also significantly different from each other (one-way ANOVA, $F=9.441$, $P < 0.01$). The area of highest density (segment 6) is on the Buck Island bank and is significantly different from the other high density area off the northwest coast (Figure 3) (Student-Newman-Keuls Test, $P < 0.05$). Segments were not treated by distance for St. Croix, as all the segments can be considered inshore.

A combined analysis indicates that number of turtles observed per nautical mile did not differ significantly

Table 4. Number of turtles per flight per nautical mile.

St. Thomas/St. John

Segment	1979 May*	June	July	Aug	Sept	Oct	Nov	Dec	1980 Jan	Feb*	Mar	Apr*	May	June	July	Aug	Sept*	Oct*	Nov	Dec	Mean No. Turtles Per Nautical Mil
1	0.00	0.55	0.16	0.79	0.38	0.58	0.48	0.20		2.51	0.18	0.75	0.74	0.49	0.54	0.33	0.33	0.00		0.36	0.52
2	0.00	0.22	0.02	0.03	0.10	0.03	0.03	0.00		0.00	0.15	0.00	0.05	0.18	0.09	0.00	0.12	0.00		0.00	0.57
3	0.63	0.21	0.22	0.71	0.81	0.48	0.51	0.63		0.18	0.21	0.22	0.87	0.47	0.41	0.59	0.18	0.00		0.31	0.42
4	0.14	0.11	0.00	0.00	0.05	0.00	0.00	0.00		0.00	0.07	0.44	0.00	0.07	0.22	0.11	0.00	0.00		0.00	0.67
5	0.00	0.04	0.03	0.00	0.00	0.04	0.00	0.00		0.16	0.00	0.00	0.00	0.11	0.07	0.04	0.15	0.00		0.00	0.04
6	0.00	0.00	0.00	0.07	0.10	0.06	0.00	0.00		0.00	0.00	0.00	0.00	0.25	0.13	0.20	0.27	0.84		0.00	0.11
7	0.00	0.46	0.27	0.35	0.64	0.82	0.34	0.00		0.76	0.00	1.11	0.85	0.40	0.95	0.07	0.33	0.00		0.00	0.41
8	2.00	1.00	1.05	1.44	2.10	1.59	1.50	2.59		2.07	0.00	1.02	3.34	1.34	1.94	1.65	3.90	3.99		0.98	1.86
9	0.10	0.00	0.12	0.22	0.50	0.07	0.08	0.10		0.00	0.00	0.20	0.26	0.11	0.41	0.29	0.39	0.11		0.00	0.16
10	0.11	0.25	0.58	0.61	0.93	0.60	0.50	0.50		0.67	0.06	0.46	0.62	0.58	0.28	0.37	0.90	0.67		0.00	0.48
11	0.25	0.31	0.43	0.54	0.87	0.68	0.59	0.44		0.12	0.13	0.26	0.41	0.65	0.24	0.29	0.48	0.27		0.19	0.40
12	0.00	0.05	0.21	0.32	0.50	0.26	0.30	0.34		0.28	0.05	0.00	0.41	0.22	0.33	0.20	0.36	0.48		0.15	0.25

*one flight only

Table 4 (con't.)

St. Croix

Segment	1979							1980		Mean No. Turtles Per Nautical Mile
	June	July	Aug	Sept	Oct	Nov	Dec	Nov	Dec	
1	0.12	0.17	0.21	0.39	0.20	0.28	0.38	0.48	0.50	0.31
2	0.12	0.22	0.17	0.09	0.17	0.11	0.24	0.27	0.30	0.19
3	0.62	0.60	0.48	0.23	0.47	0.23	0.22	0.53	0.59	0.44
4	0.27	0.73	0.34	0.39	0.23	0.13	0.23	0.25	0.36	0.33
5	0.10	0.09	0.25	0.10	0.03	0.13	0.33	0.27	0.43	0.19
6	0.61	1.78	0.61	0.60	0.76	0.21	1.35	0.62	0.65	0.80
7	0.00	0.00	0.08	0.14	0.05	0.08	0.36	0.26	0.33	0.14
8	0.02	0.11	0.05	0.20	0.14	0.26	0.20	0.45	0.20	0.18

Figure 3. Segment groupings (similarities) derived from mean number of turtles observed per flight per nautical mile. Any pair of segments enclosed by the range of any one line is not significantly different (Student-Newman-Keuls Multiple Means Comparison Test, $P < 0.05$).

St. Thomas/St. John

Rank Order	Segment #	Group
1	8	A
2	1	B
3	10	B
4	3	B
5	7	B
6	11	B
7	12	C
8	9	D
9	6	D
10	4	D
11	2	D
12	5	D

St. Croix

Rank Order	Segment #	Group
1	6	A
2	3	B
3	4	C
4	1	C
5	5	D
6	2	D
7	8	D
8	7	D

A - Highest Density, B - High Density, C - Moderate Density, D - Low Density between St. Thomas/St. John and St. Croix (one-way ANOVA, F=1.141, P n.s.).

During the census, turtles were tentatively identified by species and unidentified turtles were recorded. The results indicate that Green turtles are more commonly observed on the surface around St. Thomas/St. John, while Hawksbills appear to be more commonly observed around St. Croix (Table 5). One Leatherback was observed in the waters off Long Point, St. Croix (segment 1) on November 12, 1979. Species identification data must be treated with caution.

Size estimates for identified turtles were made during the census and indicate that Green turtles tend to be larger than Hawksbills (Table 6). This would appear to agree with data obtained from an inwater tagging study presently being carried out.

Beach checks on St. Thomas and offshore cays for 1979, 1980, and 1981 indicate a relatively high level of nesting effort by marine turtles (Table 7). Identifications of species are based on characteristics of the tracks left by the turtle. St. John data indicates a lower level of nesting effort (Table 8). No data is available for St. Croix from this period.

Table 5. Total number of turtles seen as tentatively identified by species (see text).

	1979 St.T./St.J.	1979 St.X.	1980 St.T./St.J.	1980 St.X.
Green	266	108	260	173
Hawksbill	234	135	150	196
Leatherback	0	1	0	0
Unidentified	16	66	11	168
Total	516	309	421	537
# Flights	27	25	21	29*

*All flights were made during November and December as part of the study on development of aerial census techniques.

Table 6. Mean sizes for Hawksbill and Green turtles (see text for nature of identifications) as computed from monthly averages.

	St.T./St.J.	St.X.
Green	0.69m (S=0.09)	0.79m (S=0.16)
Hawksbill	0.61m (S=0.14)	0.63m (S=0.13)
	N = 18	N = 7

Table 7. Nesting activities by marine turtles on St. Thomas and offshore cays as determined by regular beach checks.

1979

Date of Observation	Location	Species	# Nests	Comments
05-08-79	N.E. of Hans Lollik	Leatherback	-	Two adults swimming
06-16-79	Neltieberg Bay	Leatherback	1	
07-24-79	Little Hans Lollik	Hawksbill	1	
08-20-79	Great St. James	Hawksbill	2	
08-27-79	Great St. James	Hawksbill	1	Covered by sand from hurricane
09-08-79	Coconut Bay, Hans Lollik	Hawksbill	1	Destroyed by flood water
09-17-79	Sandy Bay, Inner Brass	Hawksbill	1	
09-18-79	Dry Bay, Hans Lollik	Hawksbill	3	
09-23-79	Bordeaux Bay	Hawksbill	3	
09-23-79	Caret Bay	Hawksbill	2	
09-23-79	Neltieberg Bay	Hawksbill	1	
09-23-79	Penn Bay	Hawksbill	1	
10-01-79	Inner Brass	Hawksbill	1	
10-01-79	Santa Maria Bay	Hawksbill	1	
10-04-79	Coconut Bay, Hans Lollik	Hawksbill	1	
10-05-79	Coconut Bay, Hans Lollik	Hawksbill	1	Poached
10-06-79	Coconut Bay, Hans Lollik	Hawksbill	1	
10-15-79	Great St. James	Hawksbill	1	
10-16-79	Little Bay, Hans Lollik	Hawksbill	2	
10-18-79	Sandy Bay, Inner Brass	Hawksbill	1	
10-19-79	Sandy Bay, Inner Brass	Hawksbill	1	
10-20-79	Sandy Bay, Inner Brass	Hawksbill	1	
10-20-79	Dry Bay, Hans Lollik	Hawksbill	2	
10-21-79	Penn Bay	Hawksbill	1	
10-22-79	Neltieberg Bay	Hawksbill	1	
10-22-79	Dry Bay, Hans Lollik	Hawksbill	5	
10-22-79	Caret Bay	Hawksbill	1	
10-30-79	Little Coculus Bay	Hawksbill	2	
11-11-79	Sandy Bay, Inner Brass	Hawksbill	4	
11-11-79	Caret Bay	Hawksbill	3	
11-11-79	Penn Bay	Hawksbill	1	
11-11-79	Neltieberg Bay	Hawksbill	2	
11-11-79	Little Hans Lollik	Hawksbill	2	
11-11-79	Dry Bay, Hans Lollik	Hawksbill	5	
11-11-79	Coconut Bay, Hans Lollik	Hawksbill	3	
11-23-79	Caret Bay	Hawksbill	2	
11-23-79	Coconut Bay, Hans Lollik	Hawksbill	1	
11-27-79	Little Hans Lollik	Hawksbill	2	
11-27-79	Great St. James	Hawksbill	2	
11-27-79	Little Coculus Bay	Hawksbill	2	

1979 TOTAL - 69

Data recorded by J.A. LaPlace, K. Turbe, R. Dewey, B. Seabury, E. LaPlace, [illegible] LaPlace.

1980

Date of Observation	Location	Species	# Nests	Comments
05-30-80	Dry Bay, Hans Lollik	Hawksbill	1	
06-11-80	Dry Bay, Hans Lollik	Hawksbill	1	
06-11-80	Santa Maria Bay	Green	2	
06-12-80	Santa Maria Bay	Hawksbill	1	
06-15-80	Sandy Bay, Inner Brass	Hawksbill	1	
06-15-80	Dry Bay, Hans Lollik	Hawksbill	2	
06-16-80	Dry Bay, Hans Lollik	Hawksbill	3	
06-17-80	Palm Bay, Hans Lollik	Hawksbill	1	
06-21-80	Neltieberg Bay	Hawksbill	1	
06-22-80	Penn Bay	Hawksbill	1	
06-24-80	Little Hans Lollik	Hawksbill	3	
06-24-80	Inner Brass	Hawksbill	2	
06-26-80	Inner Brass	Hawksbill	1	
06-28-80	Little Hans Lollik	Hawksbill	2	
06-30-80	Dry Bay, Hans Lollik	Hawksbill	5	
07-03-80	Coconut Bay, Hans Lollik	Hawksbill	2	
07-07-80	Dry Bay, Hans Lollik	Hawksbill	4	
07-07-80	Neltieberg Bay	Hawksbill	1	
07-07-80	Inner Brass	Hawksbill	1	
07-09-80	Bordeaux Bay	Hawksbill	4	
07-11-80	Bordeaux Bay	Hawksbill	1	
07-14-80	Little Hans Lollik	Hawksbill	4	
07-15-80	West Cay Bay	Hawksbill	2	
07-15-80	Bordeaux Bay	Hawksbill	1	
07-15-80	Inner Brass	Hawksbill	2	
07-15-80	Neltieberg Bay	Hawksbill	1	
07-15-80	Penn Bay	Hawksbill	1	
07-17-80	Dry Bay, Hans Lollik	Hawksbill	3	
07-17-80	Mandahl Bay	Hawksbill	2	
07-18-80	Coconut Bay, Hans Lollik	Hawksbill	3	
07-20-80	Little Hans Lollik	Hawksbill	2	
07-20-80	Dry Bay, Hans Lollik	Hawksbill	1	
07-20-80	Coconut Bay, Hans Lollik	Hawksbill	3	
07-20-80	Mandahl Bay	Hawksbill	1	
07-24-80	Caret Bay	Hawksbill	2	
07-24-80	Bordeaux Bay	Hawksbill	2	
07-29-80	Inner Brass	Hawksbill	1	
07-29-80	Little Hans Lollik	Hawksbill	2	
07-29-80	Dry Bay, Hans Lollik	Hawksbill	3	
07-29-80	Coconut Bay, Hans Lollik	Hawksbill	1	
07-29-80	Mandahl Bay	Hawksbill	1	
07-29-80	Penn Bay	Hawksbill	1	
07-30-80	Little Hans Lollik	Leatherback	1	
		1980 Total* -	80	

Data recorded by J.A. LaPlace, K. Turbe, and others.

*Data unavailable for the rest of 1980.

1981

Date of Observation	Location	Species	# Nests	Comments
06-17-81	Little Hans Lollik	Hawksbill	1	
06-17-81	Dry Bay, Hans Lollik	Hawksbill	5	
06-17-81	Coconut Bay, Hans Lollik	Hawksbill	1	
06-21-81	Penn Bay	Hawksbill	1	Hatched 8/26 - mongoose predation
07-16-81	Sandy Bay, Inner Brass	Hawksbill	1	
07-16-81	Penn Bay	Hawksbill	1	
07-16-81	West Cay Bay	Hawksbill	1	
07-16-81	Caret Bay	Hawksbill	2	
07-17-81	Bordeaux Bay	Hawksbill	4	
07-17-81	West Cay Bay	Hawksbill	1	
07-19-81	Sandy Bay, Inner Brass	Hawksbill	2	
07-19-81	Palm Bay, Hans Lollik	Hawksbill	1	
07-26-81	Little Hans Lollik	Hawksbill	2	
07-26-81	Dry Bay, Hans Lollik	Hawksbill	3	
07-26-81	Sandy Bay, Inner Brass	Hawksbill	1	
07-26-81	Hull Bay	Hawksbill	1	
07-31-81	Bordeaux Bay	Hawksbill	2	
07-31-81	Botany Bay	Hawksbill	2	
07-31-81	Botany Bay	Leatherback	1	
08-02-81	Neltieberg Bay	Hawksbill	1	
08-02-81	Caret Bay	Hawksbill	2	
08-09-81	Caret Bay	Hawksbill	1	
08-15-81	Clucluse Bay	Hawksbill	1	
08-26-81	Dog Island	Hawksbill	2	
08-27-81	Dog Island	Hawksbill	1	
08-29-81	Dog Island	Hawksbill	2	
09-01-81	Coconut Bay, Hans Lollik	Hawksbill	1	
09-01-81	Dry Bay, Hans Lollik	Hawksbill	4	
09-01-81	Little Hans Lollik	Hawksbill	2	
09-09-81	Caret Bay	Hawksbill	1	
09-11-81	Sandy Bay, Inner Brass	Hawksbill	1	
09-13-81	Sandy Bay, Inner Brass	Hawksbill	1	
09-15-81	Penn Bay	Hawksbill	1	
09-24-81	Little Hans Lollik	Hawksbill	1	
09-27-81	Clucluse Bay	Hawksbill	1	
		1981 TOTAL -	56	

Data recorded by J.A. LaPlace, K. Turbe, R. Boulon, S. LaPlace, J. LaPlace, E. Quetel

Table 8. Nesting activity by marine turtles on St. John. Data provided by the V.I. National Park.

Year	# Observed Nests		Species
1979	No	Information	Available
1980	17		Hawksbill
1981	27 as of 9/12/81		Hawksbill

DISCUSSION

Aerial census techniques work very well for looking at gross distribution patterns of turtles. The technique is somewhat limited because it only detects turtles when they are on the surface (thus missing all those feeding or resting) and yields no method of obtaining resighting data. Consequently, only relative population estimates are able possible. Aerial methods work very well for sampling a large area in very little time, but tend to be unreliable for detailed data such as species identifications and carapace size estimations. It is felt that an observer flying at 61m above the sea surface at 90 knots is subject to various forms of sensory interference (vibration, surface glare, wave occlusion, etc.) which limit the ability to accurately identify and size individual turtles.

Attempts to "calibrate" the width of the path observed support this since flight height (and width of observed path) did not significantly affect the numbers of turtles observed. The differences in number of unidentified turtles between St. Thomas/St. John and St. Croix (Table 5) probably relates to different observers on these two study areas.

The results indicate that turtles are equally surface active in the morning and early afternoon. They also suggest that observational capabilities are nearly the same for the two times of day. However, midday surface glare may be obscuring a number of turtles and just happen to produce similar results.

Distributional patterns indicate both a seasonal trend in turtle abundance and a preferred habitat/locality for turtles in both the northern Virgin Islands and St. Croix. There is no visible inter-island shift in densities of turtles during the year, as might occur if there were a seasonal shift in habitat or food distribution. High density localities exist in Magens Bay on St. Thomas, which agrees with data obtained from inwater turtle tagging program in progess; and around Buck Island off St. Croix, which is under Virgin Islands National Park jurisdiction. Other areas of high turtle densities in the northern Virgin Islands occur around St. John, which is also under Virgin Islands National Park jurisdiction. These areas are subjected to less poaching pressure and overall habitat disturbance, which may allow turtle populations to exist relatively undisturbed. Other dense areas may indicate locations of prime habitat and/or food availability (coral reefs and turtle grass beds).

More turtles were observed during inshore transects than offshore transects. This may also be related to abundance of food resources in the inshore areas.

It appears from nesting records that nearly all nesting activities in the northern Virgin Islands are Hawksbills with a few Leatherbacks. These identifications are based on the track characteristics left on the beach by the turtle. As seen from the results, Greens may be as abundant or more abundant than Hawksbills; however, we have no documented proof of Greens nesting in the northern Virgin Islands. It is possible that some of the Hawksbill nests have been misidentified, but we would have to see the hatchlings to be positive of identification.

The results of this study raise several questions. What happens to the turtles during the low periods of abundance? Where do the turtles go and what is producing the fluctuations in abundance? If indeed all the nesting activities around the Virgin Islands are Hawksbills, where are Green turtles nesting? Why are Greens not nesting in the Virgin Islands when they are so commonly observed here? Continued intensive population dynamics and movement pattern studies may yield answers to these and many more questions.

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